

Middle School Robotics/Mechatronics

Course Code: 21016

Rational Statement:

Robotics/Mechatronics exposes students to 21st century workplace skills and provides students with hands-on application of math and science concepts utilized in the real world.

Suggested Grade Level: 6-8

Topics Covered:

- Basic motor controls
- Solving Worldly Problems Using Robotics
- Basic Programming
- Mechanical systems
- Robotics and Entrepreneurship
- Career Possibilities

Core Technical Standards & Examples

| Indicator 1: Understand the components that make up a robot | |
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| Bloom's Taxonomy Level | Standard and Example |
| Understanding | RMMS1.1. Know the equipment used in robotics Examples: <ul style="list-style-type: none"> • Identify types of sensors • Explain various functions of motors • Explain the role of a computer as a robotic control device |
| Understanding | RMMS1.2. Identify various mechanical systems used in robotics Examples: <ul style="list-style-type: none"> • Describe a belt and pulley speed reduction system • Recognize the importance and application of mechanical advantages |
| Applying | RMMS1.3. Demonstrate the use of programming commands Examples: <ul style="list-style-type: none"> • Compile a program to demonstrating a robotic “dance” • Develop a program to move the robot along a particular shape |

| Indicator 2: Investigate the impact of robotics on our society | |
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| Bloom's Taxonomy Level | Standard and Example |
| Analyzing | RMMS2.1. Compare and contrast robotics labor vs. human labor Examples: <ul style="list-style-type: none"> • Explain the economic advantages/disadvantages of robotic labor • Evaluate the decision of hiring 4 humans vs. 1 robot to do the same job |
| Understanding | RMMS2.2. Explore career outlook for robotic applications Examples: <ul style="list-style-type: none"> • Identify jobs that will be created/eliminated by robotics • Brainstorm new robotics related careers |
| Understanding | RMMS2.3. Explore new entrepreneurial opportunities using robotics Examples: <ul style="list-style-type: none"> • Discuss a fictitious business venture utilizing robotic labor • Identify a business that could be improved using a robotic system |

| Indicator 3: Design a robot to solve a particular problem | |
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| Bloom's Taxonomy Level | Standard and Example |
| Applying | RMMS3.1. Identify robotic applications Examples: <ul style="list-style-type: none"> • In group discussion: consider the application of robotics • Draw a robot and discusses the various differences in drawings |
| Applying | RMMS3.2. Propose a robotic design Examples: <ul style="list-style-type: none"> • Sketch a diagram of a robotic "disk jockey" • Present an idea to the class of how a robot can make your quality of life better |
| Applying | RMMS3.3. Construct a robot Examples: <ul style="list-style-type: none"> • Build a Lego robot • Use an Erector set to construct a robot |
| Applying | RMMS3.4. Program a robot Examples: <ul style="list-style-type: none"> • Write and download a program to make a robot navigate through a maze • Write a program to make a robot follow a black line |
| Applying | RMMS3.5. Evaluate robot programming Examples: <ul style="list-style-type: none"> • Record data on the preciseness of a program • Analyze inconsistencies in the completion of a particular repetitive task |